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| 09/923,353 | 08/08/2001 | Philippe Boire | 211827US0CONT | 3554 |
| 22850 | 7590 | 02/21/2006 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | PIZIALI, ANDREW T | |
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1771

DATE MAILED: 02/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/923,353

Applicant(s)

BOIRE ET AL.

Examiner

Andrew T. Piziali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-30, 34-39, 44 and 45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-30, 34-39, 44 and 45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/23/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. A request for continued examination (RCE) was filed in this application on 11/23/2005 before a decision by the Board of Patent Appeals and Interferences. The RCE, declaration, and amendment filed on 11/23/2005 have been entered and the application has been withdrawn from the Board of Patent Appeals and Interferences.

Claim Rejections - 35 USC § 102/103

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 25-30, 34-36 and 39 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 5,721,054 to Vandiest et al. (hereinafter referred to as Vandiest).

Regarding claims 25-30, 34-36 and 39, Vandiest discloses an article comprising a film

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comprising titania (titanium oxide), which may be in the anatase crystal structure, on a glass substrate (column 2, lines 18-44 and column 3, lines 19-34). Vandiest discloses that the film thickness ranges from 35 to 90nm (column 3, lines 17-18).

Regarding claims 25-28, Vandiest does not appear to mention the specific crystallite average size, but Vandiest does disclose that the layers of the coated substrate may be deposited by thermal decomposition, such as by chemical vapor deposition (CVD), of titanium precursors, such as a metallic halide precursors (column 5, lines 31-44 and column 7, lines 12-15).

Considering that the current specification discloses that a substantially identical CVD method may preferably be used to deposit the layers of the coated substrate (page 13, lines 9-34 and page 24, lines 15-18), it appears that the currently claimed properties of the coated substrate are inherently possessed by the coated substrate taught by Vandiest. It appears that the titania film of Vandiest possesses a crystallite average size between 60 and 100nm.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977).

Regarding claim 26, Vandiest discloses an absorbent coating layer between the titania film and glass substrate (column 2, lines 18-30). The absorbent coating layer would form a barrier to alkali metals originating from the substrate.

Regarding claim 27, Vandiest does not appear to mention the contact angle with water, but considering the substantially identical article disclosed by Vandiest, compared to the article disclosed by the applicants, it appears that the article of Vandiest inherently possesses a contact angle with water below 5° after exposure to luminous rays.

Regarding claim 28, Vandiest does not appear to mention the RMS rugosity, but considering the substantially identical article disclosed by Vandiest, compared to the article disclosed by the applicants, it appears that the article of Vandiest inherently possesses a RMS rugosity between 2 and 20 nm.

Regarding claims 29 and 30, Vandiest discloses that the film thickness may range from 35 to 90 nm (column 3, lines 17-18).

Regarding claims 34 and 35, Vandiest discloses that the film comprising titania may also comprise tin oxide (column 4, lines 14-19).

Regarding claim 36, Vandiest discloses an absorbent coating layer between the titania film and glass substrate (column 2, lines 18-30). Vandiest further discloses that the absorbent layer may comprise chromium oxide, iron oxide and cobalt oxide (column 2, lines 52-57).

Regarding claim 39, Vandiest does not appear to specifically mention using the article as a windshield, but Vandiest does disclose that the article may be used in laminated glass applications and in architectural buildings to provide occupants with protection against solar radiation by reflection and/or absorption and eliminating the dazzling effects of intense sunshine,

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giving an effective screen against glare, enhancing visual comfort and reducing eye fatigue (column 1, lines 17-27 and column 5, lines 6-9). Therefore, it appears the coated substrate is capable of use as a windshield.

5. Claims 26-28 and 44-45 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 6,284,314 to Kato et al. (hereinafter referred to as Kato).

Regarding claims 26-28 and 44-45, Kato discloses an article comprising a thin film comprising titania, with anatase crystal structure, on a glass substrate (column 3, lines 52-65 and column 4, lines 37-48).

Regarding claims 26-28, Kato does not appear to mention the specific crystallite average size, but Kato does disclose that the layers of the coated substrate may be deposited by a variety of methods including by dip coating (column 3, lines 26-50). Considering that the current specification discloses that a dip coating method may be used to deposit the layers of the coated substrate (see Example 8), it appears that the currently claimed properties are inherently possessed by the coated substrate taught by Kato. It appears that the titania film of Kato inherently possesses a crystallite average size between 60 and 100 nm.

Regarding claim 26, Kato discloses that the porous ceramic film may comprise a multi-layer film (column 3, lines 25-50). The lower layer(s) of the multi-layer film would form a barrier to alkali metals originating from the substrate.

Regarding claim 27, Kato does not appear to mention the contact angle with water, but considering the substantially identical article disclosed by Kato, compared to the article disclosed

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by the applicants, it appears that the article of Kato inherently possesses a contact angle with water below 5° after exposure to luminous rays.

Regarding claim 28, Kato discloses that the surface of the titania film has micropores and further discloses that the diameter of the micropores can be adjusted by changing the amount of polythethylene glycol or polyethylene oxide or the molecular weight thereof (column 4, lines 14-36). Kato does not appear to mention the specific root mean square rugosity of the titania film, but considering the microporous surface of article it appears that the article of Kato inherently possesses a RMS rugosity of between 2 and 20 nm, or would possess such a rugosity by changing the amount of polythethylene glycol or polyethylene oxide or the molecular weight thereof.

Regarding claims 44 and 45, Kato discloses that Rh, Fe, or Cu may be dispersed in the coating (see column 4, line 49 through column 5, line 19 also see page 5, lines 17-22 of the current specification).

Regarding claim 45, Kato does not appear to specifically mention depositing the coating by reactive or non-reactive cathodic sputtering, but Kato does disclose that various methods may be used (column 3, lines 25-50). Kato also discloses that it is known in the art to use sputtering and does not teach or suggest that a patentable distinction exists between a coating deposited by sputtering (column 1, lines 29-37). Absent a showing to the contrary, it is the examiner's position that the article of the applied prior art is identical to or only slightly different than the claimed article. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process

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claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show obvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289 (Fed. Cir. 1983). The applied prior art either anticipated or strongly suggested the claimed subject matter. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with the applied prior art.

Claim Rejections - 35 USC § 103

6. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,721,054 to Vandiest in view of any one of USPN 4,664,934 to Ito et al. (hereinafter referred to as Ito), USPN 5,076,673 to Lynam et al. (hereinafter referred to as Lynam), or USPN 5,202,788 to Weppner.

Vandiest discloses an article comprising a film comprising titania, which may be in the anatase crystal structure, on a glass substrate (column 2, lines 18-44 and column 3, lines 19-34). Vandiest discloses that the glazing can be used for windows (column 1, lines 15-27), but appears to fail to specifically mention using the coating on an electrically controlled variable absorption glazing. Ito, Lynam and Weppner all disclose (see abstracts) that it is known to use electrochromic devices (electrically controlled variable absorption devices) as windows. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the photocatalytic coating on an electrochromic device, because the photocatalytic

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coating would provide the electrically controlled variable absorption glazing with photocatalytic properties.

7. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,721,054 to Vandiest.

Vandiest discloses an article comprising a film comprising titania, which may be in the anatase crystal structure, on a glass substrate (column 2, lines 18-44 and column 3, lines 19-34). Vandiest does not appear to specifically mention using the article as a windshield, but Vandiest does disclose that the article may be used for architectural buildings to provide occupants with protection against solar radiation by reflection and/or absorption and eliminating the dazzling effects of intense sunshine, giving an effective screen against glare, enhancing visual comfort and reducing eye fatigue (column 1, lines 17-27). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the article as a windshield because protection against solar radiation by reflection and/or absorption, eliminating the dazzling effects of intense sunshine, giving an effective screen against glare, enhancing visual comfort and reducing eye fatigue are all properties desired in a windshield.

8. Claims 25-30, 34-37, 39 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 3,984,591 to Plumet et al. (hereinafter referred to as Plumet) in view of any one of USPN 5,721,054 to Vandiest or USPN 6,284,314 to Kato.

Regarding claims 25-30, 34-37, 39 and 44-45, Plumet discloses an article comprising a titania film on a glass substrate (see entire document including column 1, lines 35-41, column 2, lines 23-32 and lines 61-67, column 3, lines 39-42 and lines 53-65, column 4, lines 33-62, column 6, lines 15-45, and column 7, lines 9-14). Plumet discloses that the film thickness ranges

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from some hundred to some thousand angstroms (some ten to hundred nanometers) (column 4, lines 51-62).

Plumat is silent with regards to specific titania, therefore, it would have been necessary and thus obvious to look to the prior art for conventional titania. Vandiest and Kato each provide this conventional teaching showing that it is known in the art to use anatase titania (see entire documents including column 3, lines 30-34 of Vandiest and column 3, lines 51-65 of Kato). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the titania from anatase titania motivated by the expectation of successfully practicing the invention of Plumat.

Regarding claims 25-28, Plumat does not mention crystallite average size, but Plumat does disclose that the layers of the coated substrate may be deposited by spray coating (column 2, line 61 through column 3, line 5). Considering that the current specification discloses that a substantially identical spray coating method may preferably be used to deposit the layers of the coated substrate (paragraph bridging pages 13 and 14), it appears that the currently claimed properties of the coated substrate are inherently possessed by the coated substrate taught by the applied prior art. It appears that the titania film inherently possesses a crystallite average size between 60 and 100nm.

Regarding claim 26, Plumat discloses that a layer of titanium oxide or copper oxide may be deposited between the substrate and the titania layer (column 4, lines 43-50). The titanium oxide or copper oxide layer would form a barrier to alkali metals originating from the substrate.

Regarding claim 27, Plumat does not mention the contact angle with water, but considering the substantially identical article disclosed by Plumat, compared to the article

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disclosed by the applicants, it appears that the article of Plummat possesses a contact angle with water below 5° after exposure to luminous rays.

Regarding claim 28, Plummat does not appear to mention the RMS rugosity, but considering the substantially identical article disclosed by the applied prior art, compared to the article disclosed by the applicants, it appears that the article taught by the applied prior art inherently possesses a RMS rugosity between 2 and 20 nm.

Regarding claims 29 and 30, Plummat discloses that the film thickness may range from some ten to some hundred nanometers (column 4, lines 51-62).

Regarding claims 34 and 35, Plummat discloses that the film comprising titania may comprise another oxide, such as tin oxide (column 2, lines 25-27 and column 6, lines 39-45).

Regarding claims 36 and 37, Plummat discloses that a tin oxide layer doped with antimony may be located between the substrate and the titania layer (column 6, lines 20-22 and column 7, lines 9-14).

Regarding claim 39, Plummat discloses that the coated substrate may be used as a windshield (column 1, lines 35-41).

Regarding claims 44 and 45, Plummat discloses that the titania layer may be doped with at least one metal such as Ce, Mo, Rh or Co (column 3, lines 39-42 and column 6, lines 39-45).

Regarding claim 45, Plummat does not appear to specifically mention depositing the coating by reactive or non-reactive cathodic sputtering, but the current specification does not teach or suggest a patentable distinction between sputtering and spray coating (see page 3, lines 28-37 and page 13, line 27 through page 14, line 9). Absent a showing to the contrary, it is the

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examiner's position that the article of the applied prior art is identical to or only slightly different than the claimed article.

9. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 3,984,591 to Plumat in view of any one of USPN 5,721,054 to Vandiest or USPN 6,284,314 to Kato and in view of any one of USPN 4,664,934 to Ito, USPN 5,076,673 to Lynam, or USPN 5,202,788 to Weppner.

Plumat discloses an article comprising a titania film on a glass substrate (see entire document including column 1, lines 35-41, column 2, lines 23-32 and lines 61-67, column 3, lines 39-42 and lines 53-65, column 4, lines 33-62, column 6, lines 15-45, and column 7, lines 9-14). Plumat discloses that the glazing can be used for windows (column 1, lines 35-41), but appears to fail to specifically mention using the coating on an electrically controlled variable absorption glazing. Ito, Lynam and Weppner each disclose (see abstracts) that it is known to use electrochromic devices (electrically controlled variable absorption devices) as windows. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the photocatalytic coating on an electrochromic device, because the coating would provide the electrically controlled variable absorption glazing with photocatalytic, conductive, and/or antistatic properties.

Response to Arguments

10. Applicant's arguments filed 11/23/2005 have been fully considered but they are not persuasive.

The applicant asserts that the declaration submitted on 11/23/2005 demonstrates that the

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method disclosed by Vandiest does not produce the claimed photocatalytic coating. The examiner respectfully disagrees. The applicant asserts that the method disclosed by Vandiest creates a titanium oxide coating that is not a “real coating” because the coating consists of a “dust” of particles.

Firstly, the examiner contends that the current claims do not exclude the photocatalytic coating from comprising a titanium oxide particle layer. The applicant appears to be arguing that a layer of particles is not considered a coating. The examiner respectfully disagrees. The dictionary definition of the word “coating” is “A layer of substance spread over a surface for protection or decoration (emphasis added).” The dictionary definition of the word “layer” is “A single thickness of a material covering a surface or forming an overlying part or segment: a layer of dust on the windowsill (emphasis added).” Considering that Vandiest discloses that the layer is uniform (column 5, lines 31-36) and may have a thickness ranging from 35 to 90 nm (column 3, lines 17-18), the 35 to 90 nm uniform thickness layer of particles is considered a coating. It is also noted that Vandiest repeatedly refers to the titanium oxide layer as a coating layer.

Secondly, the examiner contends that the current claims do not exclude the photocatalytic coating from comprising titanium oxide and tin oxide. Rather, claim 34 actually claims that the photocatalytic layer is to comprise titanium oxide and at least one oxide with a lower refractive index than titanium oxide. Tin oxide has a lower refractive index than titanium oxide and Vandiest specifically discloses that that the coating may comprise titanium oxide and tin oxide (column 4, lines 14-19). The declaration filed on 11/23/2005 specifically states “I believe that, while the conditions given by Vandiest can work well with a mixture of tin tetrachloride and water, this is not the case for titanium tetrachloride and water.” Therefore, it appears that the

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conditions given by Vandiest would work well with a mixture of tin oxide and titanium oxide because the titanium oxide particles mentioned in the declaration would be deposited along with the well formed tin oxide coating.

The applicant asserts that accumulated organic matter could not be decomposed by the titanium oxide coating layer of Vandiest because in Examples 2 and 3 the titanium oxide (non-absorbent) coating layer is buried under the Fe-Co-Cr (absorbent) coating layer. The examiner respectfully disagrees. The applicant has carefully cited only the teachings of Examples 2 and 3 of Vandiest. Although Examples 2 and 3 refer to coated substrates wherein the titanium oxide (non-absorbent) coating layer is buried under the Fe-Co-Cr (absorbent) coating layer, Vandiest clearly discloses that in a preferred embodiment the absorbent coating layer is coated directly on the substrate and the non-absorbent coating layer is an exposed coating layer (column 4, lines 19-30).

The applicant asserts that Kato fails to teach or suggest titanium crystallites having an average size between 60 and 100nm (claims 26-28) or that the coating has a contact angle with water below 5 after exposure to luminous rays (claim 27). The examiner respectfully disagrees. Kato discloses an article comprising a thin film comprising titania, with anatase crystal structure, on a glass substrate (column 3, lines 52-65 and column 4, lines 37-48). Kato discloses that the layers of the coated substrate may be deposited by a variety of methods including by dip coating (column 3, lines 26-50). Considering that the specification discloses that a dip coating method may be used to deposit the layers of the coated substrate (page 19, lines 26-39), it appears that the currently claimed properties are possessed by the coated substrate taught by Kato.

The applicant asserts that Kato fails to teach or suggest the claimed root mean square (RMS) rugosity (claim 28). The examiner respectfully disagrees. Kato discloses that the surface of the titania film has micropores and further discloses that the diameter of the micropores can be adjusted by changing the amount of polythethylene glycol or polyethyleme oxide or the molecular weight thereof (column 4, lines 14-36). Kato does not mention the specific RMS rugosity of the titania film, but considering the microporous surface of the article it appears that the article of Kato inherently possesses, or would possess such a rugosity by changing the amount of polythethylene glycol or polyethyleme oxide or the molecular weight thereof, as taught by Kato.

The applicant asserts that Kato fails to teach or suggest an alkali barrier layer. The examiner respectfully disagrees. Kato discloses that the porous ceramic film may comprise a multi-layer film (column 3, lines 25-50). The lower layer(s) of the multi-layer film would form a barrier to alkali metals originating from the substrate.

Regarding claim 39, the applicant asserts that Vandiest fails to teach or suggest using the coated substrate as a windshield. The examiner respectfully disagrees. Vandiest may not specifically disclose using the article as a windshield, but Vandiest does disclose that the article may be used for architectural buildings to provide occupants with protection against solar radiation by reflection and/or absorption and eliminating the dazzling effects of intense sunshine, giving an effective screen against glare, enhancing visual comfort and reducing eye fatigue (column 1, lines 17-27). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the article as a windshield because protection against solar radiation by reflection and/or absorption, eliminating the dazzling effects of intense sunshine,

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giving an effective screen against glare, enhancing visual comfort and reducing eye fatigue are all properties desired in a windshield.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

atp

 12/8/05
ANDREW T. PIZIALI
PATENT EXAMINER